

MONMOUTH
Mining & Manufacturing

COMPANY,

MONMOUTH, ILLINOIS,

MANUFACTURERS OF

DOUBLE STRENGTH, VITRIFIED, SALT GLAZED

Sewer and Culvert Pipe,

Drain Tile, Well Tubing, Paving Brick,

&c , &c.

—FOR SALE BY—

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Mike Jackson, FAIA

TO THE TRADE.



We desire to call your attention to certain advantages which enable us to supply the very best goods at the lowest prices.

Our works have been in operation since 1870. In the year 1886 they were entirely remodeled, and our capacity for manufacturing doubled. We enlarged our facilities in every way, and have nothing but the best, latest and most approved machinery, buildings and kilns. And we are one of the few factories in the *United States* whose extensive trade requires the CONSTANT RUNNING OF TWO (2) SEWER PIPE MACHINES.

Our factory is a model in every particular, employing one hundred and fifty men in the various stages of this work. We are prepared for an economical and rapid production of the very best class of work.

Independent of these great advantages we have an inexhaustible supply of the raw material on our own premises, and thereby have advantages that *cannot* be overcome by our less fortunate competitors, who purchase their clays at a distance from their factory. Our sewer pipe clay is dug and mined on our own ground right at the door of our factories, and is of a kind peculiarly adapted to the making of Sewer Pipe. Standing up under intense heat, at the same time it thoroughly vitrifies and takes the salt glaze, making it practically indestructible.

We take pleasure in giving any information in our power to those contemplating the use of any goods in our line, and can assure our patrons prompt delivery, which is a very important matter to the purchasers of our ware. We have established agencies in most of the large cities, where small orders can be filled and at a minimum cost.

We aim to carry at all times a *large stock with full supply of fit* that our customers can depend upon getting *everything* short notice.

Our shipping facilities are unexcelled. The main line of the *Chicago, Burlington & Quincy R. R.*, the *Central Iowa R. R.*, the *Chicago, Burlington & Northern R. R.*, and the great *Santa Fe system—Chicago, Santa Fe & California R. R.*, being our outlets. We have the best of switching facilities *from each of these great lines right into our yard*, thus giving us the best outlet for the U. S. east and west, north or south, and enabling us to obtain the lowest freight rates possible to the SOUTH, SOUTHWEST, WEST, NORTH and NORTHWEST. Our customers can rely upon having their orders filled promptly and at the lowest prices possible for the quality of ware we manufacture.

We trust by fair dealings for a continuance of the liberal patronage we have received in the past.



DOUBLE STRENGTH VITRIFIED SALT GLAZED SEWER PIPE.



We manufacture this ware from 3 to 24 in. in diameter, and it is unquestionably the best material known to be used for *City Sewers, Culverts, Aqueducts, Cisterns*, and underground drains of all kinds, and being *vitrified and glazed with salt*, is consequently indestructible by the action of acids, water or the weather. Most of the cities in the United States are using this kind of pipe exclusively for sewers, it being both cheaper and better than brick, and undeniably better than cement pipe. (See page 5 on cement pipe.) Our clay pipe being smooth and uniform inside offers less obstruction to the current and is consequently less liable to become filled with sediment.

During the twenty (20) years of our experience in the manufacture of *sewer pipe* we have watched the growing interest in the subject of sewerage, and studied the demands of our trade. And by our *skilled labor, enlarged facilities, improved and powerful machinery*, "TWO (2) SEWER PIPE PRESSES" of the latest and best designs, the material is rendered homogeneous and uniform throughout, and under great pressure (steam presses being used for the purpose) the pipe is made very compact, and at a high temperature becomes a thoroughly *vitrified and iron-like body*, which is *impervious to the action of acids, gases and steam*, all of which are found in the city sewers. And with *cheap coal* we are better prepared *than ever before* to guarantee you a quality of *ware excelled by none*. We have altered all our dies, making our pipe *extra strong of the double strength thickness*, and complying with the requirements of the *United States sewer commissioners*, viz: The thickness of this pipe is uniformly one-twelfth of its internal diameter, which greatly increases its strength as compared with the ordinary sewer pipe known as the *Ohio Standard*, which is *all single strength*. We have abandoned entirely the manufacture of *single strength pipe*. Cities figuring on a system of sewerage should be very careful not to allow bids on *Single Strength to compete with Double Strength*. Sometimes this point is overlooked by city officials, and afterward makes trouble. Some manufactures endeavor to take advantage on this point and do not specify *double strength pipe* in their bid to the city, and of course can make a lower price, thus securing the contract over a manufacturer who *manufactures only double strength pipe*.

Single Strength Standard pipe is much lighter and thinner and is not to be compared with *Double Strength sewer pipe*. The former will not stand *one-half the pressure of the latter*. *Double strength sewer*

pipe should be in thickness not less than one-twelfth (1-12) of the diameter of the pipe for 12 inches and larger; and small sizes as follows, viz: 3 and 4 inch pipe not less than $\frac{5}{8}$ inch thick; 6 inch not less than $\frac{3}{4}$ inch thick; 9 inch not less than $\frac{7}{8}$ inch thick; 12 inches not less than 1 inch thick; 15 inches not less than $1\frac{1}{4}$ inches thick; 18 inches not less than $1\frac{1}{2}$ inches thick, and 24 inches not less than 2 inches thick. We make *all* our pipe up to these thicknesses.

Our *sewer pipe clay* is mined at the door of our factory and is inexhaustible in quantity. It is of a peculiar kind of *clay and rock* rarely found that will undergo intense heat and at the same time *thoroughly vitrify* and *take the salt glaze*, making it perfectly indestructible; it is burned to a perfect shape and color, is nicely glazed, smooth and uniform.

These pipes are made with sockets, by means of which the joints can be made water tight if necessary by the use of a little hydraulic cement mortar to fill the crevices about the end of the pipe within the socket, thus forming a solid immovable joint as soon as the cement sets.

We beg to say further in regard to the *Double Strength Sewer Pipe* we manufacture, that we are *pioneers* in the manufacturing of pipe, being one of the first west of Ohio, having commenced its manufacture in 1870, since which time we have by constant study and experience added *several new improved facilities*. We do not aim to compete with the cheap so-called *sewer pipe* now in the market, as there never was a superior article made that did not have an imitator.

You can readily see the superiority of our ware by referring to the few of scores of letters now in our possession, published in this book. See pages 10 to 15.

Our prices are uniform to all purchasers. We consider one man's money as good as another. Do not make a mistake in buying poor pipe because it is cheap, but buy that which you know by your own personal knowledge, or by the experience of some responsible person, *to be an absolutely reliable article*. We shall be glad to hear from you, and to send you our bottom prices on
GOOD DOUBLE STRENGTH SEWER PIPE.

Double Strength Vitrified Salt-Glazed vs. Cement Pipe.

We have often been asked why Cement Pipe is not as good as Vitrified Pipe, and for the information of those making this inquiry we give the following explanation:

Vitrified Salt Glazed Pipes are necessarily made from good clays, which stand a *great degree of heat*. The pipes, after being made and dried, are placed in a close kiln and gradually subjected to an *intense heat*. When this heat is of sufficient intensity, coarse salt is thrown upon the fires in small quantities. A portion of the salt vaporizes, which vapor, combining with the silica in the clay, produces a soda-salt or glass, which is a glaze and is a part of the *body of the pipe*. It requires good clay to endure heat of sufficient intensity to vaporize the salt, and this heat is so great that the pipes are thoroughly vitrified and very hard—regular stone ware, and will last as long and stand the exposure stone will.

Vitrified—The literal meaning of the term vitrified is fused earth, which most expressively and simply asserts the nature of a material that has been known and used for the past two thousand years. First, perhaps, in antiquity, we may refer to its use as a material for forming drain pipes. Sewers built of it have been found in the excavations of Herculaneum and Pompeii, destroyed by an eruption of Vesuvius, A. D. 79.

The use of Vitrified Pipe for drainage has become so general in its application, and its benefits so highly appreciated by those who have possessed themselves of its advantages, that it has now attained the rank of one of the modern improvements, and thereby considered indispensable in every private and public building.

The *Cement Pipes* are generally made from a poor and cheap grade of cement and sand, tamped into a mold and then dried. Manufacturers of the ware expect it to stand up under the same pressure as Vitrified pipe, and it is condemned for the following reasons:

1st. It will not stand one-third ($\frac{1}{3}$) the pressure of Vitrified Pipe.

2d. It is subject to the action of acids, of which all sewers are so full.

3d. It absorbs water, and will soon melt and crumble down.

4th. It is subject to the action of frost, which soon crumbles it.

5th. The cement pipes produced as a rule are so porous that they soon become honey-combed and crush in the ditches with the weight of dirt above.

Many towns have used cement pipe to their sorrow, and the list is rapidly lengthening of cities and towns compelled to dig up and throw out cement pipe. In many cases it has so completely

decayed as to cause the streets to cave in. Cement pipes have been often condemned, and are going out of use. The most casual observer can try the experiment in a moment, by taking a piece of cement pipe and pouring acid on it. It will effervesce at once and show abrasion of surface, while the same acid poured on vitrified pipe shows no action whatever.

In this connection we append the following clippings—we might give many, but these given will suffice to show how cement pipe stands:

From *Engineering News and American Contract Journal*, Manchester, N. H., October 30, 1886—"The city officials are agreed that a considerable appropriation must be made for extending the sewerage system, and replacing the old cement pipe on the present system. City Engineer Bennett states that the system at West Manchester must be rebuilt, as the cement pipe is crumbling away, and the sewers are too near the surface."

Local from *Racine (Wis.) Daily Times*, May 23, 1887—"The cement pipe on High street, about one hundred feet in length, is nearly all cracked and will have to be taken out."

Office Eau Claire Plumbing & Con. Co., Eau Claire, Wisconsin, Dec. 22, 1889.
Monmouth Mining & M'g Co., Monmouth, Ill.—

In answer to your letter of the 12th would say that my experience with cement pipe has been very discouraging for it. I constructed a sewer in Ashland in 1888 where I had laid about 2700 feet of 24 in. and about 3000 feet of 20 in. Every foot of it had to be replaced with your vitrified pipe.

The cement pipe was specially made for Ashland by the Northwest Sewer Pipe Company of Oshkosh. They have also a cement pipe works here, but our city has not used a foot of it in the last year in constructing about seven miles of sewer. I find that cement pipe is unreliable. Last spring I wrote to about thirty or forty of our best engineers throughout the country to get their opinions on cement pipe, and enclosed find a circular containing some of the names and their opinions.

Yours truly,

J. P. Fox, Gen. M'g'r.

The following is a few of them:

Ashland, Wis., May 11, 1889.—Mr. J. P. Fox, Eau Claire, Wis.—Dear Sir: Replying to your letter of April 27th, I would say that my experience with cement pipe has been very discouraging, to say the least of it, and I will never use it again for anything, if I can get vitrified pipe at any price.

Yours truly,

G. W. CARRINGTON, City Eng.

Omaha, Neb., May 31, 1889.—J. P. Fox, Esq., Eau Claire, Wis.—Dear Sir: In answer to yours asking my view as to best pipe suitable for sewers, I would say that in my opinion the salt glazed vitrified clay pipe is preferable to all others for general use. Cement pipes are so dependent upon the material of which they are made and that is of so variable a nature that it cannot be relied upon, as a rule, for uniformity in strength and durability, as the vitrified pipes. In addition to this the smaller pipes cannot be made as smooth as glazed clay. You can test a clay pipe generally by the clearness of its ring, but a cement pipe is only tested by actual trial, under pressure and submersion, or a test of all cement used as the work of manufacturing goes on.

Very respectfully,

ANDREW ROSEWATER, Civil and San. Eng.

Sioux City, Iowa, May 20, 1889.—J. P. Fox, Gen. M'g'r, Eau Claire, Wis.—Dear Sir: Your letter of the 1st at hand. In reply would say the experience I had with cement pipe was not satisfactory. We laid 150 feet of 18 inch for drainage and the pipe broke and crumbled. Another place there was about 250 feet of 8 inch to drain a spring and it crumbled and fell to pieces. I would not use cement pipe under any consideration. I think the pipe is not to be compared to vitrified pipe.

DAVID KIRKE, City Eng'r.

CARRYING CAPACITY OF PIPE IN GALLONS PER MINUTE.

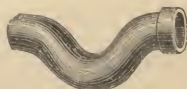
Size of Pipe.	1 Inch Fall per 100 Feet.	2 Inch Fall per 100 Feet.	3 Inch Fall per 100 Feet.	6 Inch Fall per 100 Feet.	9 Inch Fall per 100 Feet.	1 Foot Fall per 100 Feet.	2 Foot Fall per 100 Feet.	3 Foot Fall per 100 Feet.
3 Inches	13	19	23	35	40	46	64	79
4 “	27	38	46	66	81	93	132	163
6 “	75	105	129	183	224	258	364	450
8 “	153	216	265	375	460	529	750	923
9 “	205	290	355	503	617	711	1006	1240
12 “	422	596	730	1033	1273	1468	2076	2554
15 “	740	1021	1282	1818	2224	2464	3617	4467
18 “	1168	1651	2022	2860	3508	4045	5604	7047
21 “	1619	2399	2949	4157	5100	5880	8271	10416
24 “	2396	3387	4152	5871	7202	8303	11744	14466



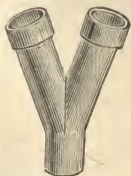
H H TRAP.



V TRAP.



RUNNING TRAP.



BREECHES.



SLANT.



INCREASER.



REDUCER.



$\frac{1}{4}$ CURVE.



S TRAP.



P TRAP.



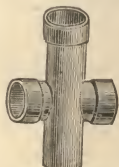
$\frac{1}{2}$ CURVE.



SQ'RE ELBOW.



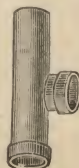
Y JUNCTION.



TT JUNCTION.



HHP TRAP.



T JUNCTION.



STRAIGHT

PRICE LIST

— OF —

Double Strength Standard

Vitrified, Salt-Glazed Sewer and Culvert Pipe.

THICKNESS OF STANDARD PIPE—Should be one-twelfth the diameter of the pipe; or six inch pipes three-quarters inch thick; twelve inch pipes, one and one-eighth inches thick; fifteen inch pipes, one and one-quarter inches thick; eighteen inch pipes, one and one-half inches thick; twenty-four inch pipes, two inches thick.

SIZE OF PIPE.	AREA IN INCHES.	WEIGHT PER FOOT.	PRICE OF STRAIGHT PIPE PER FOOT.	PRICE OF CURVES AND ELBOWS EACH.	PRICE OF SLANTS, INCREASERS AND REDUCERS EACH.	PRICE OF TWO FEET BRANCHES EACH.	PRICE OF DOUBLE JUNCTION AND BREECHES EACH.	PRICE OF TRAPS, ALL KINDS, EACH.	NO. FEET TO THE CAR LOAD.
3	7.068	7	\$.15	\$.50	\$.45	\$.60	\$.90	\$.1.70	3500
4	12.566	10	.20	.60	.60	.80	1.20	2.10	2500
5	19.784	13	.25	.75	.75	1.00	1.50	2.50	2000
6	28.274	17	.30	1.00	.90	1.20	1.80	2.90	1600
7	39.197	20	.35	1.25	1.10	1.40	2.10	3.50	1300
8	50.265	26	.40	1.50	1.20	1.60	2.40	4.00	1000
9	63.677	30	.50	1.75	1.50	2.00	3.00	5.00	800
10	78.539	35	.60	2.10	1.80	2.40	3.10	6.00	700
12	113.09	45	.75	2.75	2.25	3.00	4.50	8.50	550
15	176.71	65	1.00	3.75	3.00	4.00	6.00	12.00	400
18	254.46	97	1.50	4.75	4.50	6.00	9.00		300
20	314.16	115	1.75	5.75	5.25	7.00	10.50		250
21	345.19	125	2.00	6.75	6.75	8.00	12.00		220
22	380.68	135	2.10	7.00	7.00	8.40	12.60		220
24	45.39	165	2.50	8.00	7.50	10.00	15.00		160

Apply at this office for discounts and terms.

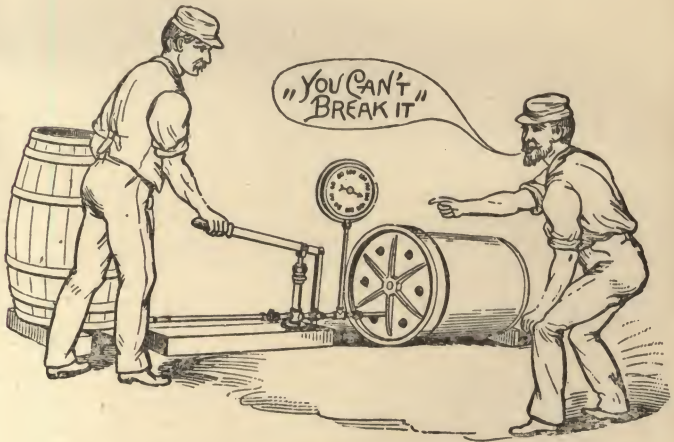
Delivered on board cars and wagons, free of charge, at Monmouth, Illinois.

Special discounts on large orders.

HOW DO WE KNOW OUR PIPE IS THE STRONGEST PIPE MADE?

Because no other Pipe will stand the
pressure our Pipe will.

We wish to call your attention to the following test of our
SEWER AND CULVERT PIPE, made by Engineer ANDREW ROSEWATER,
of Omaha, Neb., as represented here by this hydraulic press, with
the following results, breaking several pieces of pipe, viz:



6 inch breaking at 200 pounds to square inch.

9	"	"	"	180	"	"	"	"
12	"	"	"	160	"	"	"	"
15	"	"	"	150	"	"	"	"
18	"	"	"	140	"	"	"	"
20	"	"	"	110	"	"	"	"
21	"	"	"	90	"	"	"	"

TESTIMONIALS:

City Engineer's Office, Helena, Montana, Dec. 14, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Dear Sirs: In reply to yours of the 6th inst. I have pleasure in stating that having had occasion to use the Monmouth Mining & M'f'g Co.'s Double Strength sewer pipe, in sizes varying from 6 to 24 inches in diameter, for about 16 miles of sewer, (six were laid in St. Paul, Minn., and ten in Helena, Montana.) I take pleasure in stating that I always found it to be of an excellent quality, true in form, homogeneous in structure. I am thoroughly satisfied that your pipe is the strongest and best of the kind manufactured in the west.

Yours truly,

G. N. MILLER, City Eng.

City of Lincoln, Engineer's Department, Lincoln; Neb., Jan. 13, 1890.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: Yours of the 11th came to hand this morning, and in reply to your request would say that I can recommend your sewer pipe, as we have used considerable of it, especially pipe in large diameters, in both our sanitary and storm systems of sewerage. The pipe that you have sent to Lincoln has been uniformly good pipe. They have been round, so that no trouble is experienced in fitting. They are also straight, hard burned and well glazed, and when any pipe possesses the above qualifications they are good pipe. I can cheerfully commend them to the use of any in need of pipe.

Yours truly,

O. N. GARDNER, City Eng.

Office of J. E. Riley & Co., Contractors, Omaha, Neb., Sept. 20, 1889.—Mr. A. Rosewater.—Dear Sir:—As you are aware, I presume, I have a large sewer contract in Denver, requiring a large quantity of pipe. I am especially anxious to get a good pipe and am negotiating with the Monmouth Mining and M'f'g Co. Before closing I am anxious to get your opinion as to its general character. I know it seems to give satisfaction here, but you will know more about it as your operations have extended over a larger territory. Please let me know what you think of it and I shall be very thankful to you.

Yours truly,

J. E. RILEY.

Omaha, Neb., September 23, 1889.—J. E. Riley, Esq.—Dear Sir:—Referring to yours of 20th inst., asking my views on the quality of the Monmouth, Ill., pipe, I would say that I regard it as a good substantial sewer pipe and would consider it suitable to the requirements of the best class of work. Last summer I had some doubt as to the pipe possessing the requisite strength in view of an inner course which appeared as if the pipe had not been uniformly burned, but upon several actual tests with a hydraulic machine I found that in all such cases the pipe actually proved to be stronger than those presenting a uniform burnt section. I have been using it in the Grand Island sewer work this year in sizes varying from 8 to 24 inch and have no hesi-

tancy in saying that they will do fully as well as other standard western pipe.

Very respectfully,

ANDREW ROSEWATER, Civil and Sanitary Eng'r.

Office of City Engineer, Wichita, Kansas, Dec. 26, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: We are much pleased with the quality of the sewer pipe you have been furnishing during the past year for the construction of our sewerage system. We have used the product of other factories on this improvement, but find that a larger percentage of your pipe comes within the requirements of the specifications than that of any we have used. Its strength is remarkable, and the uniformity with which this quality as well as that of concentricity manifests itself, should be eminent properties commending the pipe to those contemplating its use.

Very truly,

H. H. JACKMAN, City Eng.

Office of L. C. Jackson, Wichita, Kan., Nov. 15, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: During the past eight months I have received about eighty car loads of your pipe. This pipe has been used in city work under the most rigid inspection, and has proved perfectly satisfactory.

Yours respectfully,

L. C. JACKSON.

Office of C. A. Brockett Cement Co., Kansas City, Mo., Nov. 15, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Illinois.—Dear Sirs:—We have handled over 300 cars of the Monmouth Mining and M'f'g Co.'s Sewer Pipe for city use here during the last three years. We have handled pipe from all other manufacturers but the pipe obtained from the Monmouth Mining and M'f'g Co. has always given much better satisfaction than any other. Seldom ever having a piece rejected by city inspection unless it is occasionally when a pipe has been cracked or chipped in shipping.

We furnished this pipe for the largest sewer contract ever let here, which took several miles of pipe. On the whole job there was but very few pipe condemned, both the contractor and the city engineer acknowledged that they had never seen such a perfect lot of pipe.

Respectfully yours, C. A. BROCKETT,

President C. A. Brockett Cement Co.

City of Duluth, Office of City Engineer, Duluth, Minn., Jan. 15, 1890.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: In the last three years we have used a large amount of your pipe and find it of uniform quality and hardness, there being a less amount of culling necessary to bring it to our specifications than with any other make supplied in this city. Our specifications are very rigid, as all our sewers are on steep grades and the pipe would soon wear out if not of first quality.

Respectfully,

WM. B. FULLER, City Eng.

Union Railway Storage Co., Wholesale and Retail Building Material, Minneapolis, Minn., Nov. 15, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Dear Sirs:—As requested in a letter just received. We have handled the Monmouth Mining and

M'f'g Co. Pipe for years and because of its great toughness and strength and glaze it has fully supplanted all other pipe in the market where a uniformly double strength pipe was needed. We have marketed the following places for sewer work: Duluth, W. Superior, St. Cloud, Fargo and Moorehead, Fergus Falls, Brainard, Howard Lake, Chippewa Falls, Stillwater, Faribault, Northfield, Mankato and many other places of lesser note, and the fact stands undisputed that this pipe is in demand at all of the points named. Our city engineering department use but very little pipe for sewers proper, and what they do use is for catch basins and is generally of this pipe. We can say truthfully for a good pipe use M. M. & M. Co. pipe. Respectfully, J. S. HOMAN, Gen. M'g'r.

Minneapolis, Minn., Jan. 24, 1890.—J. S. Homan, Esq., Gen. M'g'r Union Ry. Storage Co.—Dear Sir: In regard to the Monmouth Mining & M'f'g Co.'s stone pipe used by the city of Minneapolis during the past season, I would say that it is heavier, thicker, smoother and tougher than any other we have used. It will consequently be less liable to breakage, discharge more water per area and carry a heavier load than any Illinois or Missouri pipe we are acquainted with. We have used it more or less for a number of years and have found no fault with it.

Yours respectfully, W. D. VANDUZEE, 1st Ass't. City Eng.

H. P. Rugg & Co., dealers in Plumbers', Steam and Gas Fitters' Supplies, Etc., St. Paul, Minn., November 15th, 1889.—Monmouth Mining & M'f'g Company, Monmouth, Ill.—Dear Sirs: It affords us gratification to be able to say a word in regard to your Double Strength sewer pipe. We have been in business here upward of twenty years and have handled large amounts of sewer pipe. In our own city we have furnished your pipe on several important lines of sewers, and have had the satisfaction of having the engineer tell us that it was the best pipe he had ever seen and caused his inspectors the least trouble. Last year we furnished the city of Helena a bill of your pipe amounting to \$45,000 and they were exceedingly well pleased with it. It was all shipped out on the St. P. M. & Manitoba R. R., a road that had but just gone into operation, and was naturally rough. Notwithstanding this there was not half of 1 per cent. of it that was broken or damaged in transit, and our remembrance now is that there was no claim whatever made for breakage excepting a little on one car. The pipe is so heavy and well burned that it is hard to break it. Yours truly, H. P. RUGG & Co.

F. J. Linne & Co., Building Materials, St. Paul, Minn., Nov. 15, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Dear Sirs: We handled the sewer pipe during the past two seasons. It has been used largely in our city work and in every case has given the best satisfaction. We have also shipped a number of cars to Duluth and in no instance has any been rejected. The Government has used a great deal here, and their specifications call for "Monmouth or equal." Our city engineer says it is the best pipe ever used in this city. Your truly, F. J. LINNE & Co.

Office of Board of Public Works, LaCrosse, Wis., Dec. 13, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: Having used your sewer pipe for the past three years we do not hesitate to testify to the perfect satisfaction it is giving. We consider the double strength pipe to be very strong, well formed, free from cracks or blisters, and well glazed. In fact, it is preferable to any sewer pipe on this market.

Very respectfully yours, T. S. VICKERE, Eng. and Sec.

W. A. Roosevelt Company, Jobbers in Wrought Iron Pipe, Brass and Iron Goods, Etc. LaCrosse, Wis., Dec. 9, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Dear Sirs: Answering your inquiry of the 7th inst. we can cheerfully say that during the past five years during which we have handled and distributed your Standard Double Strength Vitrified Salt Glazed sewer pipe (and have handled a good deal of it) it has given our customers and ourselves the very best of satisfaction. We have found your sewer pipe smooth, well glazed, and very strong, and think durable for the reason that we have never had any of it break or give out in any way, and we unhesitatingly pronounce it a first-class sewer pipe in every respect.

Yours very truly,

W. A. ROOSEVELT Co.

Omaha, Neb., Dec. 12, 1889. Monmouth Mining & M'f'g Co., Monmouth, Ill.—Dear Sirs: Referring to yours of the 10th of December relative to the sewer pipe furnished by your company in the past year, I would say that so far as I had an opportunity to observe the Monmouth pipe has given excellent satisfaction. I had special occasion to test the strength of some of the larger sizes for the city of Grand Island and was agreeably surprised to find them better than I had expected and meeting all the requisites of first class sewer pipe. The Monmouth pipe coming to my notice this year has been uniformly smooth, well glazed and free from warps or cracks. I regard the pipe furnished by you this year as fully meeting the requirements of good sewer pipe. They will bear favorable comparison with the better classes of pipe upon the Western market.

Very truly,

ANDREW ROSEWATER, Civil and San. Eng.

Sioux City, Iowa, Nov. 14, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Dear Sirs:—We have used the Sewer Pipe manufactured by the Monmouth Mining & M'f'g Co., for the last three years in Sioux City, and our authorities prefer them to all others on account of their smoothness and uniformity of size and shape. They fit well in the joints and make a very regular sewer, easy to clean out by ball and chain. Those shipped to me for our last contract, during the months of August and September, 1889, were especially fine in quality.

GEO. W. OVERHOLTZER.

Sioux City, Iowa, Nov. 14, 1889.—Geo. W. Oberholtzer, Sioux City.—Dear Sir: The Monmouth sewer pipe used in constructing the public sewers during the last two years has given the best of satisfaction in every particular as to smoothness and uniformity of size and shape, and strength.

Very respectfully,

HENRY WINGELAND, City Eng.

City of Oskaloosa, Iowa, Dec. 23, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Dear Sirs: This city has during the past five years put in several miles of sewer of different sizes, from 9 to 24 inch pipe. We wish to say to you that after having tried several different makes of sewer pipe we have arrived at these conclusions:

1st. Your tile has the greatest strength of resistance to lateral pressure.

2d. Your tile has the smoothest glaze, inside and out, of any we have tried.

3d. Your pipe has the strongest and closest fitting joints.

4th. Your sewer pipe is the cheapest because it is the best. It withstands all the rough usage incident to railroads and drayage, all of our orders having been promptly filled.

Very truly yours, J. A. COFFIN, City Clerk.

IRA J. STODDARD, City and County Engineer.

James Horigan, Plumber, Gas and Steam Fitter, St. Joseph, Mo., Dec. 1, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.

—Dear Sirs: Enclosed we hand you draft for \$936.63 in payment of our account to date as per statement enclosed. We have been using your pipe and fittings quite extensively in our business during the last few years. We find them to be first class goods in every respect. The pipe is strong, thoroughly vitrified and glazed, even and well formed, standing the handling and transportation with but a very small percentage of breakage.

Respectfully yours,

JAS. HORIGAN.

City Engineer's Office, Burlington, Iowa, Jan. 14, 1890.—Bernard Bros. & Mercer, Burlington, Iowa.—Gentlemen: It affords me much pleasure to state that the vitrified salt glazed sewer pipes purchased from you by the city of Burlington during the last ten years, has given entire satisfaction for either sewer construction or culvert purposes, and I can recommend the same to anyone who wants to use a first class article.

Respectfully yours,

WM. STEYH, City Engineer.

A. W. Bushnell, Manufacturer of Asbestine Stone and Dealer in Sewer Pipe, Lime, Cement, &c., Peoria, Ill., Nov. 14, 1889.—Monmouth Mining and M'f'g Co., Monmouth, Ill.—Gentlemen:—I have used your Double Strength Sewer Pipe for the last five years in this city and the same has given entire satisfaction. I have yet to hear the first complaint against the Monmouth Double Strength Sewer Pipe. I consider your pipe equal to any and far superior to many. I handle from 10 to 15 car loads of your Sewer Pipe per annum.

A. W. BUSHNELL.

Office of C. H. Little & Co., dealers in Crockery, Glassware, Stoneware, Etc., Freeport, Ill., Jan. 16, 1890.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Sirs: We have handled your pipe for the past four years with perfect satisfaction to ourselves and our customers.

Respectfully, C. H. LITTLE & CO.

Freeport, Ill., Jan. 16, 1890.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—We hereby certify that the city of Freeport has

laid a number of miles of pipe manufactured by the Monmouth Mining & M'f'g Co., and that it has in every way proved satisfactory.
F. E. JOSEL, City Eng.

Office of Leffingwell Bros., Wholesale Roasted Coffee, Clinton, Iowa, Dec. 9, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: We have used your pipe from the smallest to the largest sizes for a number of years, and it has given the most perfect satisfaction. Taking in connection with this the courteous treatment you have always extended us, in making our deals pleasant with you, we take great pleasure in recommending your pipe and yourselves to the trade.

Very truly yours,

LEFFINGWELL BROS.

Clinton, Iowa, Jan. 3, 1890.—Monmouth Mining & M'f'g Co.—Gentlemen: We have used your sewer pipe for several years past and find it to be of good material, well made and glazed and in every way satisfactory, and we shall probably call on you for more.

Yours respectfully,

C. W. CHASE, Mayor.

Office of Davenport Steam Heating Co., Davenport, Iowa, Jan. 17, 1890.—Monmouth Mining & M'f'g Co.—Gents: We have been selling your sewer pipe exclusively for the past three years, and are pleased to say that it has given entire satisfaction to our trade. We have furnished a considerable amount of large pipes to our city, and also to railroad, gas and other corporations, which have proven entirely satisfactory in every case.

Very truly, yours,

G. T. AHRENS, Sec'y.

Hausen & Lineham, Wholesale Coal, Salt, Lime, Oil, Cement, and Grain Commission Merchants, Dubuque, Iowa, Dec. 9, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: Replying to your favor of the 6th inst, would beg to say that the quality of the sewer pipe which you have been furnishing us the past season has been entirely satisfactory. We have used over 30,000 feet of it in the construction of our city sewers, and it has been thoroughly satisfactory in every way to the city and its engineers.

Yours truly,

HAUSEN & LINEHAM.

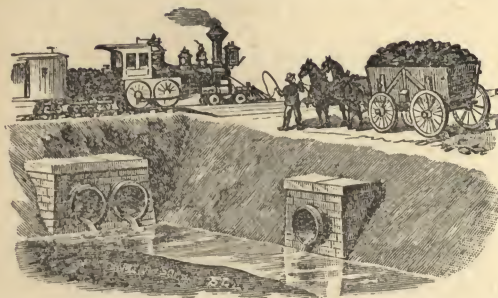
Shenandoah, Iowa, Dec. 9, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: We have used various grades of your sewer pipe and it has given general satisfaction. We put down 150 feet under our principal street four years ago, and it is as good now as when put down. Later on we put down about five car loads of pipe ranging in size from 12 to 24 inches, with the same results. We have never had to make any repairs and we cannot see that we will have to make any for many years to come. From our experience we feel that we can safely recommend your wares for durability, economy and safety to the traveling public.

Respectfully,

J. B. CARTER, Mayor.

J. W. SCHWARTZ, Engineer and Street Com.

RAILROAD AND WAGON ROAD CULVERTS.



PRICE LIST OF CULVERT PIPE OF EXTRA QUALITY AND WEIGHT.

SIZE.	AREA IN INCHES.	WEIGHT PER FOOT.	PRICE PER FOOT.	THICKNESS IN INCHES.	NO. FEET TO CAR.
9	63.677	30	\$.50	1	800
10	78.539	35	.60	1	700
12	113.09	45	.75	1 $\frac{1}{8}$	550
15	176.71	65	1.00	1 $\frac{3}{8}$	400
18	251.46	97	1.50	1 $\frac{5}{8}$	300
20	314.16	115	1.75	1 $\frac{5}{8}$	250
21	345.19	125	2.00	1 $\frac{3}{4}$	220
22	380.68	135	2.10	1 $\frac{7}{8}$	220
24	452.39	165	2.50	2 $\frac{1}{8}$	160

Next to sewerage the largest demand for this pipe now is for *Railroad, Turnpike and Common ROAD CULVERTS*, taking the place of small plank bridges and box culverts, so common and so constantly out of repair. A *vitrified pipe culvert*, if properly laid, will last for ages without repairs, being cheaper as well as the best in the end. The demand for sewer pipe for this purpose is doubling every year, and county commissioners and township trustees who have not used it should put down two or three culverts and satisfy themselves of its superiority over other material.

This culvert pipe is especially adapted for *railroad and wagon road culverts and crossings*. It is made from our superior quality of *sewer pipe clay*—made, however, *extra heavy, thoroughly vitrified*, and is, therefore, *extra strong*. Railroad and highway commissioners the last few years have just begun to realize what a complete culvert can be built with our culvert pipe, which lasts as long as stone and it does not cost as much as a hard wood plank trough or box culvert. A culvert composed of this *extra heavy double strength pipe*, if properly laid with brick or stone abutments, as repre-

sented in the cut above, will form a culvert that will last for an indefinite period.

We have an extensive trade with Railroads, and also with County Road Commissioners, Supervisors and Overseers of common wagon roads, and we desire to call the special attention of COMMISSIONERS throughout the country to the use of our *Culvert Pipe* for *culverts* across common roads in place of small plank bridges and box culverts so common in country roads, and which are constantly getting out of repair and last but few years at best, whereas, our *pipe culverts* will last for ages without any repairs whatever. Our *culvert pipe* is good forever and will more than pay for itself in a few years.

How to Construct a Pipe Culvert.

The construction of a pipe culvert, although a very simple matter, should nevertheless be done with care. The first consideration after laying pipe in a ditch or trench that is prepared for the pipe is to make sure of a firm bearing along each side of the pipes. This is best done by tamping and ramming about each pipe the loose dirt as it is thrown in upon the pipes. This should be carefully done from its bearing or the bottom of the ditch up to the center line of the pipe, then grade in the dirt to the natural road bed. If this work is thoroughly executed our Culvert Pipe will stand any degree of pressure without injury.

Excavate in all cases a suitable foundation for abutments at each end of a culvert. If stone or brick is not used for this purpose, as represented on page 16, a post should be planted securely in the ground on each side of the pipe at each end of the culvert, and planks cut to fit around the pipe firmly nailed to the upright pieces; this will keep heavy washing rains, and thirsty stock from doing any damage to the culvert. The stone or brick abutments are preferred, for when constructed with our pipe the culvert will last a life time.

Pipe culvert should be kept clean at the outlet, and have a good fall. This is best accomplished by arranging the foundation for your pipes a few inches above the natural bed of the stream. If you are putting the pipe culvert in a cut or where you have several feet to fill on top of the pipe, you can make your foundation for the pipes twelve (12) to eighteen (18) inches up from the bottom of the slough. If your pipe is not below the surface enough (say two (2) feet) to allow you to do this, you should excavate your ditch at the outlet so as to give the water a good fall, and the culvert will then always wash itself clean, thus preventing dirt from accumulating in the culvert pipe and freezing up in the winter half full, or more, with mud and water. Culverts are

frequently found in this condition along public roads. This is an essential point in constructing a pipe culvert.

In answer to numerous inquiries as to how deep the earth on OUR CULVERT PIPE may be safely laid, our reply in general is, the deeper the better. There is not to our knowledge a single instance on record where a sound culvert pipe, properly bedded in a deep cut, has ever been crushed by the superincumbent earth; and we have known our pipe to be used in cuts 25 to 30 feet deep. The fact is, that in deep cuts the filling over the pipes is practically supported by the sides of the cut, and forms an arched bridge over the pipes, so that if they could be properly removed without disturbing the earth above, when once well settled, the earth would still remain in position for a while, which would prove (indicate at least) that the deeper pipes are buried in the ground the safer they are, and the less they are affected by any additional weight at the surface.

It depends altogether on the width of the ditch or how large a pipe culvert you have, that the distance above the pipe the earth is self supporting, but on large pipe it would only be a few feet. If the top of the pipe when laid is less than two (2) feet below the surface of the roadbed, first cover the pipes with dirt to the depth of a few inches and level it off, then place a few poles, fence rails or plank, over the pipes, lengthwise, and then throw on more dirt and grade off to the level of the roadbed. The rails, poles or plank will serve to equalize the pressure on the pipes when the wheels of a heavy wagon pass over them, but if the pipe is two (2) feet or more below the surface, no other protection is necessary.

The size of pipe required in each particular case depends of course upon the amount of water to be provided. And this depends upon the area of ground from which the rainfall runs to the culvert. This area can generally be estimated with sufficient accuracy by careful observation without surveying instruments, and the size of pipe required can be determined by referring to our table on page 7. When there is any doubt as to the proper size it is better to put in a pipe one size larger than is necessary rather than one size to small.

Some manufacturers, anxious to effect a sale, recommend second class pipe for culverts, whilst the very best pipe should be used, and for these reasons: A culvert being short and open at both ends, there is always a strong draft through it; the dampness in the ground lowers the temperature and in cold weather freezes harder than at any other place, so that when the ground thaws out it heaves and may wrench and even wreck cracked pipe, or if pipe happens to be soft and porous, when frost comes out in the spring it will crumble.

Our first class Culvert pipe will never be affected. They are vitrified, and where properly put in are solid as stone, lasting for ages.

TESTIMONIALS:

Iowa Hospital for the Insane, Mount Pleasant, Iowa, Dec. 18, 1889.—Burnard Bros. & Mercer, Burlington, Iowa—Gentlemen: In extending our sewer to the new wings and other buildings which we have constructed in connection with this institution, we have used the vitrified sewer pipe which you handle, and I desire to hand you my endorsement of the goods for such purposes, and for road-culverts, drains, etc. I know of no sewer pipe equal to this, or of no manner of constructing a sewer which will be so satisfactory and durable.

Very truly yours,

H. A. GILMAN, Supt.

Veo, Iowa, December 16, 1889.—Bernard Bros. & Mercer, Burlington, Iowa.—Dear Sirs: In reply to yours of the 10th, would say your sewer pipe we bought two years ago was equal in every respect to your representation, and after using them a year we were convinced they were what we wanted instead of small board bridges, and then bought our second car load. I think it but a matter of time when they will take the place of all the small bridges. I expect we will want another load for 1890.

Yours truly,

SANFORD BRAY,

Tp. Clerk Black Hawk township, Jefferson County, Iowa.

Burlington, Cedar Rapids & Northern Railway—Engineer's Department, Cedar Rapids, Iowa, Jan. 14, 1890. Monmouth Mining & M'f'g Co.—Gentlemen: Answering your letter of the 11th inst. During the past three years we have used a great deal of your pipe of various sizes under our road-bed and for farm and public crossings, and it has given satisfaction. We consider it at least as good as any other make we have tried and it costs us less money. The percentage of your pipe broken in transit is very small.

Yours very truly,

H. F. WHITE, Ch. Eng. B. C. R. & N. Ry.

Office of J. F. Wallace, Civil Engineer, 205 LaSalle St., Chicago, Ill., Jan. 15, 1890.—Monmouth, Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: It affords me pleasure to be able to say a word in regard to your Double Strength Vitrified Salt Glazed Sewer and Culvert Pipe.

I have had occasion during the past few years of my engineering work to use a great deal of your pipe for large culverts under road-beds and for farm and public crossings, and in every case have I found your pipe highly satisfactory. Your pipe for culverts is not only a great saving over any other material, but when properly used with either stone or plank abutments will last a lifetime. I believe your pipe to be thoroughly vitrified and thoroughly salt glazed, making it a good pipe for sanitary sewers and by all means preferable to any other material for the construction of sewers. I have always found your pipe to be of an excellent quality, true in form, of equal length, and possessing

wonderful strength. I am thoroughly satisfied that your pipe is equal if not superior in quality to any manufactured in the United States. Believe me very truly yours,

JOHN F. WALLACE, Civil Eng.

Centralia & Chester Railroad Company, Gen. Mgr's Office. Sparta, Ill., Dec. 13, 1886.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: During the past two years we have used several car loads of your Double Strength culvert pipe with improved sockets, and we have found the quality first class and the shape true. All the pipe we have bought of you has been of first class quality and workmanship and has given entire satisfaction.

J. M. McCUTCHEON, Gen'l Mgr.

H. W. SCHMIDT, Supt. Cons. and Civil Engineer.

Monmouth, Ill., Dec. 2, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gents: We have been using your Double Strength Sewer and Culvert Pipe for culverts the past five (5) years and find it a great saving over the old wood and plank culverts. We have over 100 miles of roads in our township (Hale) and a great many culverts and small bridges, and until we commenced using your culvert pipe we bought plank boards to keep these places in repair, which we found very expensive and a large amount of work every year. Now we are replacing these wooden boxes and bridges with your culvert pipe, which costs no more than plank, and are glad to think that there will soon be no more bumping of wagons over wooden bridges and culverts, no holes for horses to break their legs in or get frightened at, and we can say emphatically that we consider your pipe culverts the greatest improvement that has ever been made in our roads.

Your culvert pipe is very strong, never caving in and standing the action of frost over winter, and the hauling of heavy loads constantly over these pipe culverts, and in muddy weather the wheels cutting through to the pipe in many cases, but in every instance the pipe has stood the pressure, never caving in.

Yours truly,

GEO. SPENCE, Com. and Treas. of Hale Township.

Albia, Ia., Dec. 18, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Messrs.: We have used your sewer pipe in this (Monroe) county and are well pleased with its use for culvert purposes. We find that where the ends are properly protected with abutments, either of rocks, timbers or planks, that it is far preferable to any other material that we have ever used for culvert purposes. In most places the first cost in using the sewer pipe is not greater than bridging with lumber, let alone the replacing of the wooden structure in a few years, while if the sewer pipe had been used the work would have been permanent.

The quality and strength of your ware seem to be all that is necessary for the uses to which we have put it.

Respectfully yours,

HERMAN SNOW,

Ex-Member Board of Supervisors, Monroe County.

Washinhton, Iowa, Jan. 10, 1890.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gents: I was street commissioner of this city for the six years prior to this year, and during that time we used a great many car loads of sewer pipe and tile, for sewers, culverts and crossings, and consider the Monmouth pipe the best of any we used.

M. C. COVENDER, Ex-Com.

H. F. Samson, Com.

Lomax, Ill., Jan. 22, 1890.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: This is to certify that I have put in several car loads of sewer pipe in the south part of Henderson county. Most of it was of your make and it gives the best satisfaction of any that we have used for strength and durability.

Yours truly, R. A. LOMAX, Com. Henderson County.

Peoria, Ill., Dec. 20, 1888.—Monmouth Mining & M'f'g Company—Gents: I have used a quantity of your sewer pipe for culverts under our road-bed and the sewer pipe for other purposes, and in all cases your pipe gave entire satisfaction in every instance.

Yours, etc.,

G. R. COBLEIGH,

Supt. Cons. of Lake Erie & Western R. R.

Swan Creek, Ill., Dec. 21, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Gentlemen: In answer to yours of Dec. 14, 1889. We have been using your double strength culvert pipe for three or five years and find it a great saving to the township over the old way of plank culverts. We in our township are glad to think that there will soon be no more bumping of wagons over wooden culverts and no holes for horses to break their legs in or get frightened at, and we can say emphatically that we consider your pipe culverts the greatest improvement that has ever been made in our roads. We would heartily recommend it to all boards of commissioners in every township. We consider your double strength culvert pipe a great saving of money over the wooden culvert.

B. F. SAMPSON,

IRA W. DAVIS,

Commissioners of Highways of Point Pleasant Township.

City Engineer's Office, Dubuque, Iowa, Dec. 9, 1889.—Monmouth Mining & M'f'g Co., Monmouth, Ill.—Dear Sirs: In answer to your inquiries with reference to your sewer pipe as used in this city the past year by the different contractors, I am pleased to state that they gave very good satisfaction, being remarkably strong and uniform in section, and with smooth, well glazed surface, with a very small percentage of fractures or rejected.

Respectfully yours,

M. TSCHIRGI Jr., City Eng.



Farmers' Hard Burned Drain Tile.

It is claimed by our best, largest, most practical and successful farmers of long experience in drainage, that the increase in crops shows that tiling will pay for itself within three years, and often in one year; also that Drain Tile made in two-foot lengths is preferable to one-foot length, especially five inch and above.

Because, 1st: The capacity of carrying water is greater than one-foot length.

2d: The two-foot lengths will hold their position better, not tilt and get out of shape in the ditch, especially in low swamps, marshy fens and watering places.

3d: They are less liable to gather rubbish and obstructions of all kinds that pass through a tile drain.

4th: They are chamfered and reamed out at the ends like Sewer Pipe, thus making them smooth and uniform.

All our Drain Tile is composed mostly of an unequalled quality of clay and rock, mined eighty (80) to ninety (90) feet under the ground, and excels the *ordinary* drain tile manufactured exclusively of surface clay. We also have superior advantages in our equipment of improved mills and pans for grinding and mixing our clays, large and powerful presses for compressing and moulding same.

Our Tile is burned in *large kilns* of six to eight car load capacity, and is consequently *burned very hard, smooth, nicely glazed and uniform.*

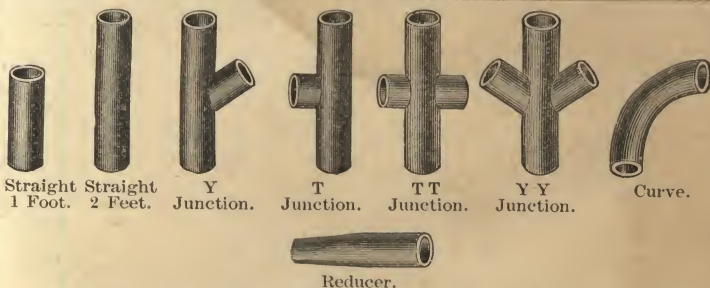
The demand for this Tile the past season has been so great that it was impossible for us to fully supply it, although our capacity for the manufacture of tile is from *sixty to seventy-five* cars per month. This compels us this season to increase our facilities at least fifty per cent., and we thus hope to be able to fill all orders promptly. We can furnish five inch tile and above in two-foot lengths if desired, or one-foot length from two inch up to ten inch.

We make two-foot branches, with the connection on a level with the bottom of the main drain, for flat ground and watering places, where it is impossible to get a fall otherwise.

For prices and description of tile and branches, see next page.

PRICE LIST OF BURNED FARM DRAIN TILE.

Size.	Area in Inches.	Weight Per Foot.	Price per 1000 Feet.	Curves and Reducers Each.	1 Foot Branches Each.	2 Feet Branches Each.	No. Feet to Car Load.
2	3.141	3	\$ 20.00	\$.20	20c		8,000
3	7.068	4½	30.00	.20	30		6,000
4	12.566	6½	45.00	.25	30		4,000
5	19.625	9	60.00	.30	40	\$.50	3,000
6	28.274	12	80.00	.40	50	.70	2,200
7	38.484	15	110.00	.50	70	.75	2,000
8	50.265	22	150.00	.70	75	.90	1,250
9	63.617	26	200.00	.75	1.00	1.00	1,000
10	78.539	33	250.00	1.00		1.15	850
12	113.09	42	325.00	1.25		1.25	750
15	176.71	60	450.00	1.50		2.00	500
18	254.46	92	700.00	2.25		2.50	350
20	314.16	106	1000.00	3.00		4.00	250
24	452.39	150	1625.00	5.00		6.50	200



The following table shows the number of feet required per acre at the distances stated, laying the tile in rows:

15 ft. apart.....	2940 ft.	40 ft. apart.....	1102 ft.
20 " "	2205 "	50 " "	880 "
25 " "	1760 "	100 " "	440 "
30 " "	1470 "	150 " "	270 "

We make two-foot branches, with the connection on a level with the bottom of the main drain, for flat ground and watering places, where it is impossible to get a fall otherwise.

Five-inch tile and above made in 2 ft. lengths, if wanted.

Apply to this office for terms and discounts. Special discounts on large orders.

Well Tubing.



Made in 2 and 3 Foot Lengths.

Size	Area in Inches	Price per 1000 Ft	Weight per Ft
6	28.274	\$ 80.00	12
7	38.484	110.00	15
8	50.265	150.00	22
9	63.617	200.00	26
10	78.539	250.00	33
12	113.09	325.00	44
15	176.71	450.00	60
18	254.46	700.00	92
20	314.16	1000.00	106
24	452.39	1625.00	150

VITRIFIED CLAY PIPE FOR WELLS.

Within the past few years stone-ware pipes have come into very general use for tubing bored wells and they are certainly the cleanest and most durable material ever used for that purpose, and by the use of augers similar to post augers, constructed for the purpose, wells can be easily and cheaply built. When lined with *our clay pipe* the well is superior to any others in point of cleanliness and durability.

When wells are dug the large size are used and are far superior to either brick or stone. Our sewer pipe or socket pipe is used in sandy soil, especially quick sand wells, where tight joints are necessary, and by cementing these joints a tight, continuous and impenetrable tube is formed. These sand wells are best constructed by a man working inside the large pipe and as he throws out the sand the pipe, by its own weight, settles down. When the first pipe gets below the surface put on another and so continue until the required depth is reached.

Within the past few years the attention of the public has been called by physicians and others to the foul and insanitary condition of wells in general, and while this agitation has resulted in some good, yet a great deal remains to be done. We are very apt to overlook or forget to examine into the condition of our wells because they are covered up and not easily brought to our attention. We do not see what is going on down in them, and perhaps the first intimation received of our water being impure is sickness or death in families. Nearly all cases of typhoid fever, diphtheria and malaria are directly traceable to bad drainage or foul well water. Now you can have a well perfectly constructed at one-third ($\frac{1}{3}$) the cost of brick or stone, which will be in first-class condition for the next century.

Nearly all wells are built of brick, few of stone. A brick well two (2) feet in diameter has thirty-seven (37) feet of mortar joints to every foot of its depth. It is self evident that even with the best of material and workmanship some small openings will remain, through which insects, worms and surface water will find their way into the well.

We have received the highest recommendations for our Vitri-fied Salt Glazed Well Tubing, which seems to be especially adapted to this purpose. They are made in sections two (2) feet long and are impervious to *anything and everything*, and if ordinary care is taken in putting them down they will keep the well free from all impurities, and will be just as sound one hundred (100) years hence as when built.

Paving and Curb Brick



These paving brick are superior to any other for side walks, floors in cellars, carriage houses and stables, engine and boiler rooms, and especially adapted for side walks. They are made of clay and rock mined one hundred (100) feet under ground, are very hard, thoroughly vitrified and indestructible by any ordinary wear. They are the *most durable paving brick manufactured*. Water, frost, salt or acids will not injure them. They are cheaper than stone by less than one-half ($\frac{1}{2}$), and will out-last any other material used for walks or floors. This curbing with the one-quarter ($\frac{1}{4}$) brick cut to fit for the corners, as illustrated above, we manufacture. These brick make a very neat and complete sidewalk.

It takes only thirty-two (32) brick to the square yard, as you will observe they are much larger than the ordinary common brick.

PRICE LIST.

Paving brick, size $9 \times 4\frac{1}{2} \times 2$ inches, per 1000.....	\$25 00
Corners to fit angles. per 1000 brick (4 to a brick).....	50 00
Borders or curbing, $12 \times 9 \times 1\frac{1}{2}$ inches, per 1000.....	100 00

CELLAR WINDOW CURB.



The most complete Curb for a cellar window you can use Cheap and durable. Price \$1.00.

WELL AND CISTERN TOP.



This makes a complete air tight top for a cistern and well that no obstruction can enter. Price, 50c.

FLOWER STAND.



These are made of our best mixed clay, hard burnt, nicely glazed, and the bottom being perforated with one or more holes they make an elaborate flower stand.

Size, 19 in. high, 8 in. diameter. We make them one-half this size also. Apply for prices.

CHAIR.



An ornament to your yard. Will never rust or wear out. For prices etc. apply at this office.

Monmouth Mining & Manufacturing Company

MANUFACTURERS OF

DOUBLE STRENGTH
SEWER PIPE
HARD BURNED
DRAIN TILE & CULVERT
PIPES 2¹⁰/₂₄ INCHES
IN DIAMETER



MONMOUTH. ILL. ☼